

ROC-Rib Deployable Ka-Band Antenna for Nanosatellites, Phase II



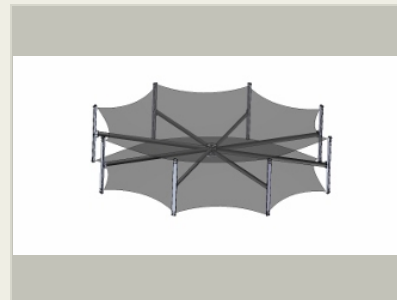
Completed Technology Project (2016 - 2020)

Project Introduction

In these days of tight budgets and limited funding, NASA is constantly looking for new ways to reduce development time and costs of future spacecraft. This is the driving spirit behind NASA's increasing interest in the CubeSat platform, and the vision that is guiding development and demonstration of higher-risk technologies that can eventually lead to low-cost atmospheric science from CubeSats. For example, a tantalizing next-generation CubeSat system would combine a high-gain deployable antenna with a high-frequency Ka-band transponder to support very high bandwidth communications on the order of 10s of Mbps and/or very high-resolution radiometric remote sensing of atmospheric phenomenon. To address this need, Tendeg proposes to develop a Ka-band deployable mesh antenna that can package within a 3U CubeSat volume and deploy to diameters of 0.8-1.5m. The antenna employs a backing structure that is a hybrid wrap-rib/perimeter-truss design. A net supports a reflective mesh while the entire assembly provides the structural depth and surface accuracy needed for Ka-band operation.

Anticipated Benefits

The primary NASA target application for the proposed deployable antenna technology is future NASA CubeSat and SmallSat spacecraft for which communications up/downlink or passive RF remote sensing measurement resolution is a major bottleneck in the system design. In particular, the proposed technology will enable very high bandwidth communications on the order of 10s of Mbps and/or very high-resolution radiometric remote sensing of atmospheric phenomenon. Beyond NASA applications, the proposed deployable antenna technology could see use in other military and commercial applications where data up/downlink or passive RF sensing is also a considerable need. Terrestrial-based applications might include portable military and commercial communication networks that desire Ka-band operations and can benefit from lightweight, man-portable and deployable high-gain apertures.



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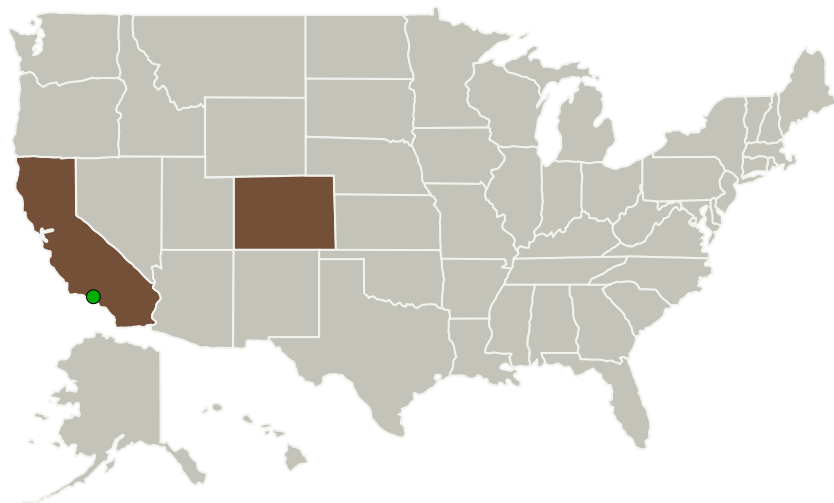
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Tendeg LLC	Lead Organization	Industry Small Disadvantaged Business (SDB)	Louisville, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California	Colorado
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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tendeg LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Managers:Robert A Jones
Carol R Lewis**Principal Investigator:**

Gregg Freebury

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Images

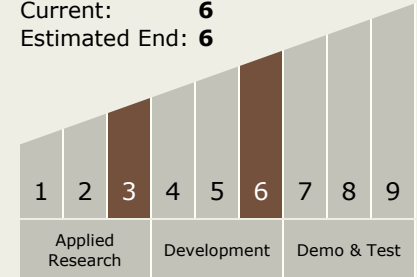


Briefing Chart Image

ROC-Rib Deployable Ka-Band
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(<https://techport.nasa.gov/image/132354>)

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System